

OPERATION MANUAL

MUTOH SCRIBER

ET202

MUTOH

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1. MAIN FEATURES OF ET202

The ET202 is a high accuracy lettering machine which uses a program-controlled Z-80 CPU for plotting characters.

- 1) The ET202 has an interactive editing function and monitor/memory so that the user can correct any input mistake.
- 2) The characters put into the LCD can be plotted either by technical pen or ceramic pen.
- 3) Plotting area is 25 mm high \times 180 mm wide, enough to cover A4 size sheet.
- 4) Frequently used texts may be stored into memory at 100 different addresses (with total capacity of up to 4000 characters).

2. PRECAUTIONS BEFORE USING THE ET202

The following precautions should be observed for efficient use of the ET202.

2-1. Safety Precautions

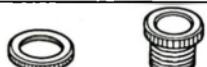
- 1) Since the ET202 uses many precision components, attempts to repair by unauthorized persons can cause damage. Internal inspection and adjustments should be left up to a qualified service representative.
- 2) Do not allow liquid or other outside particles to enter ET202 as this can cause failures.
- 3) During operation, do not switch the power off or remove the power plug. A power cut, for example, can erase the memory contents.
- 4) Do not rest heavy object on the adapter cable, bend it or step on it, as this can cause failure. Also do not reconnect the cable.
- 5) Do not rest heavy objects on the display portion or apply it excessive pressure.
- 6) During use, excessive noise or shock can cause memory contents to be lost and balance to be upset. If this occurs, set the power switch off and then switch on once again.
- 7) Do not touch the technical pen cartridge arm during operation.
- 8) If the unit becomes soiled, wipe it using a soft cloth.
Do not use thinners, benzine or other chemical solvents as these can damage the outer surfaces of the ET202.
- 9) Avoid storing or using the ET202 in the locations exposed to excessive dust level, as this can impair proper operation.
- 10) In the event of using with the drafting machine, please observe first the vertical brake of the drafting machine is activated to insure that the unit does not slide. The board should be set horizontal.
- 11) Be sure to press the keyboard with fingers. The keyboard may malfunction if pushed with nail-tip, top of ballpoint pen or similar hard objects.

2-2. Storage Precautions

- 1) The ET202 should not be stored in locations which subject it to direct sunlight, heating equipment or other high temperature locations. Locations with high humidities and dust levels should also be avoided. In addition, avoid subjecting the ET202 to excessive shock or twisting stress during operation.
- 2) If the ET202 is to be left unused for a long period, set the power switch to OFF (0) and remove the AC adapter from the line outlet. Do not snatch the power cord when removing it from the outlet, as this can cause an open at the connector.

2-3. Initial Unpacking and Inspection

When unpacking the ET202 from its carton, check whether all parts have been received in undamaged condition, referring to the table below.

Appearance	Name	Description	Qty.
	Operation Unit	310 × 114 × 44mm 1.0kg	1
	Adapter	57 × 78 × 42mm 0.45kg	1
	Instruction Manual		1
	Technical pen adapter (See p.14)		1 set

CHAPTER 1. GENERAL DESCRIPTION AND CONFIGURATION

1-1. Operation Unit

In using with a drafting machine, the operation unit must be mounted to the chuck arm (see Fig. 1). The keyboard operation can be made by one hand, and characters are indicated on the LCD.

It is recommended during the operation to lock both vertical and horizontal brakes of the drafting machine.

Characters and numerals preprogrammed, are plotted by pressing the keyboard. Also using the memory function so that frequently repeated texts can be recalled.

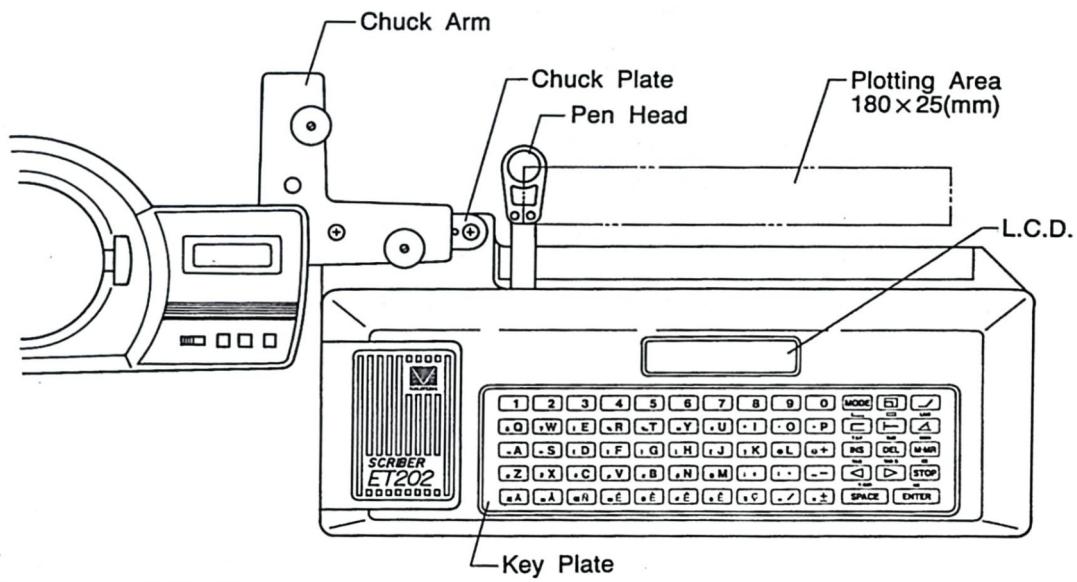
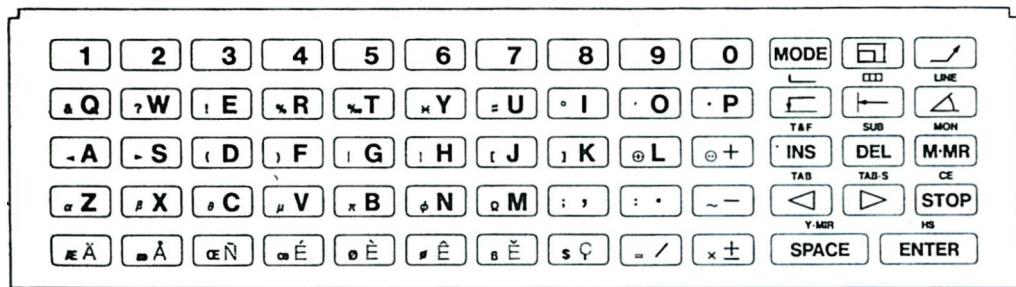


Fig. 1.

1-2. Keyboard Arrangement and Nomenclature

The keyboard consists of 50 characters keys and 14 command keys.



1-3. Character Types

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

abcdefghijklmnopqrstuvwxyz

0123456789

ÄÅÑÉÈËËÇ äåñéèëëç

ÆæŒœØøß αβθμπøΩ

& ? ! % # () { } [] \$ * = < ~ ; : ^ ' " + - ± / , . % ° ← →

25

1-4. Mounting the Technical Pen

The pen adapter comprises of three types of threaded sleeves to receive the following commercially available pens.



Sleeve for KOH-I-NOOR, ROTRING, STAEDTLER or other similar pens.

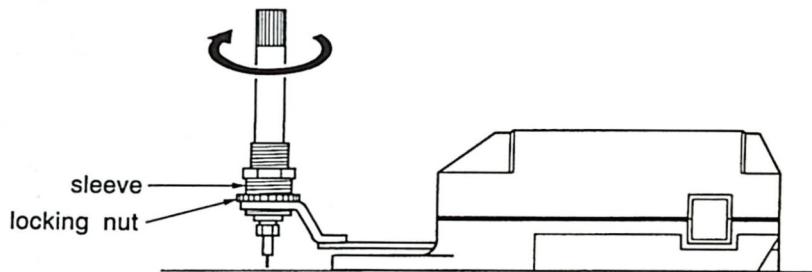


Sleeve for FABER-CASTELL or other similar pens.

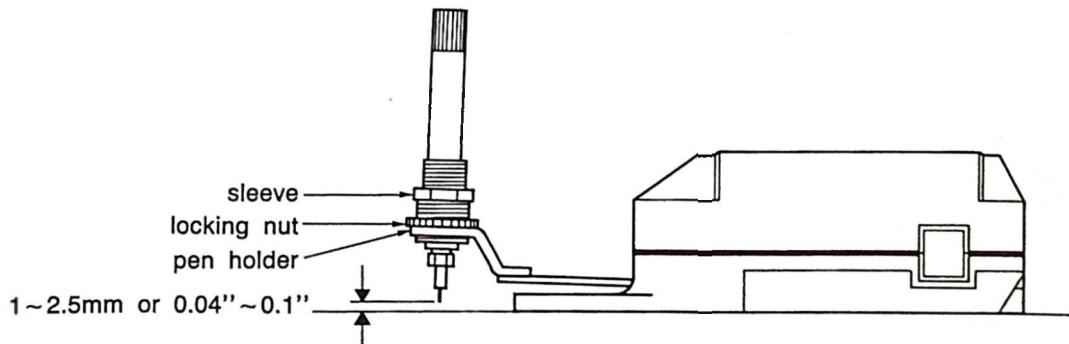


Sleeve for GRAPHOPLEX or other similar pens.

Select the sleeve in accordance with your pen and screw the pen (barrel removed) into the sleeve until it dead stops. Then screw the locking nut halfway into the sleeve. This completes the assembly of the sleeve, pen and locking nut.

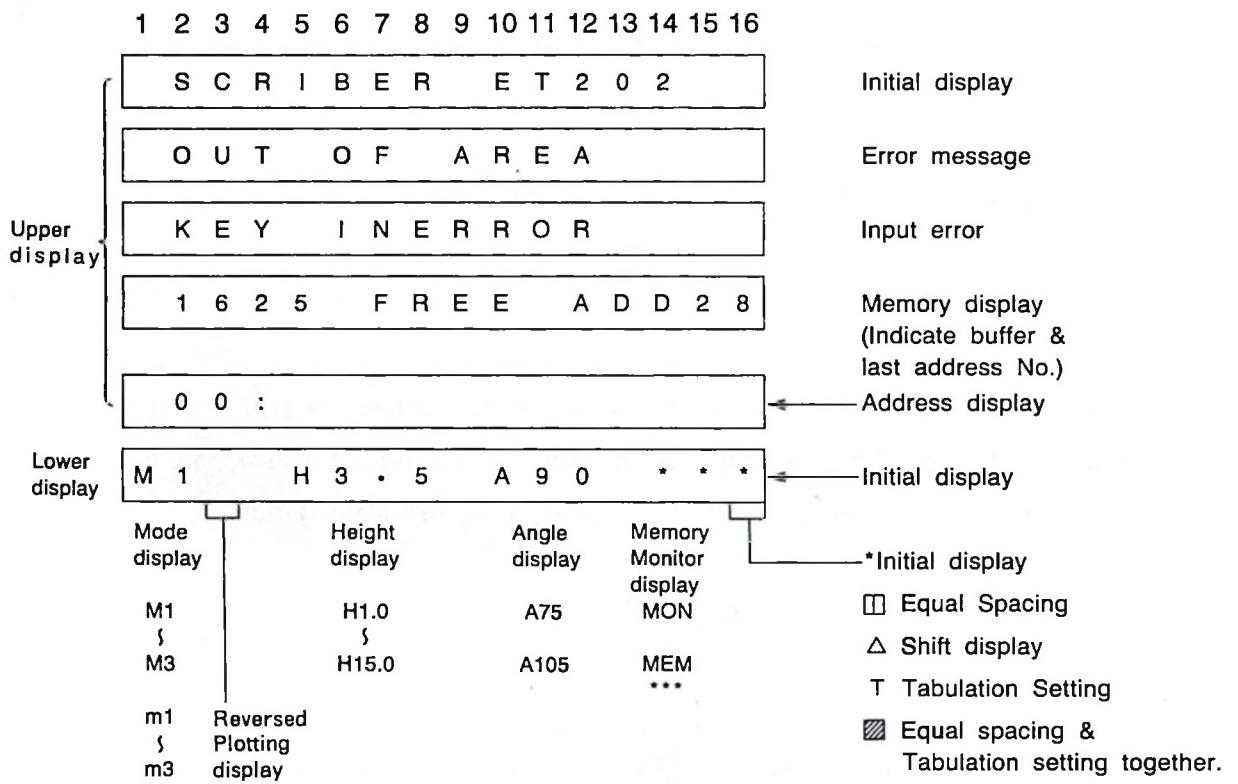


Screw the assembled sleeve into the pen holder until the height of the pen tip above the drafting medium is 1 to 2.5mm (0.04" to 0.1"). Tighten the locking nut and secure the sleeve in this position.



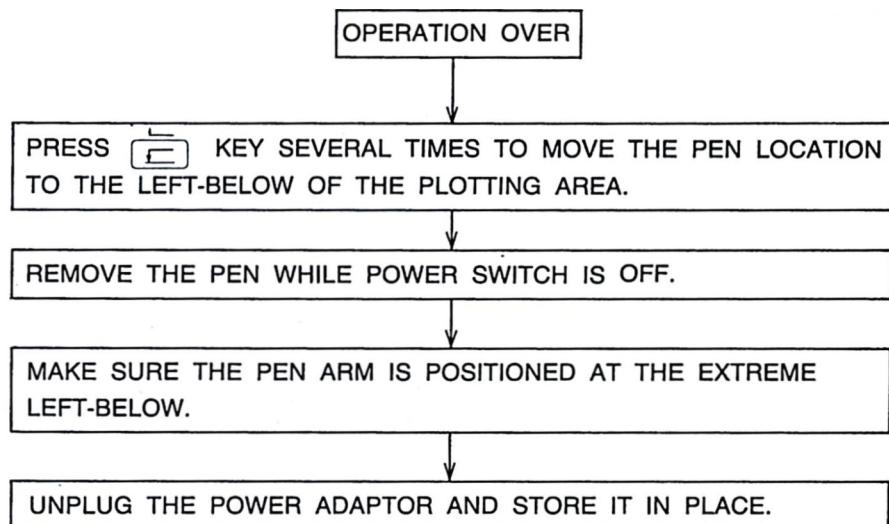
1-5. LCD Display

The LCD monitor is a 16 character two line display is used to verify lettering and plotting operations. The LCD monitor shows you angle of character inclination, character height, mode number etc., on the line so that you can control them at any time, and thus prevent inputting mistakes.



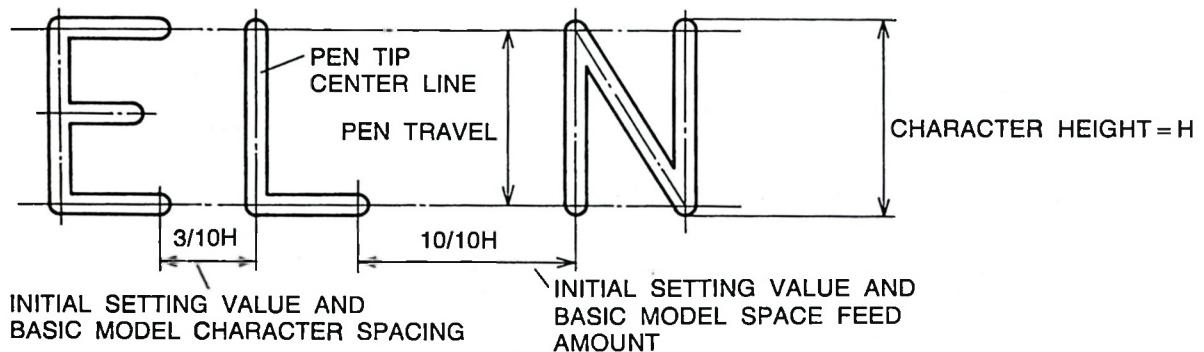
1-6. Power Supply Connecting Method

- (1) After setting up to start lettering, insert AC adapter cable into the operation unit and then plug it into the outlet.
- (2) This completes preparation for operation. Follow the sections describing the basic operation procedures. After use, take the below-mentioned steps for storage.



1-7. Plotted Font and Dimensions

- (1) The Model ET202 features alphanumeric characters which conform to the ISO 3098/IB=ISO Standards.
- (2) Symbols conform to ISO standards. (with some defined by Mutoh)
- (3) Character and line spacing are proportional and conform to ISO Standards.
- (4) Character height and accorded dimensions are as shown below.



Specifying the character height automatically decides the character width.

The amount of pen movement is $9/10H$ for character height of between 1mm and 4.9mm.

For character of 5mm and greater, the pen movement is height units 0.5mm.
(The standard pen thickness of 0.5mm.)

1-8. Character Height and Number of Lines and Number of Characters.

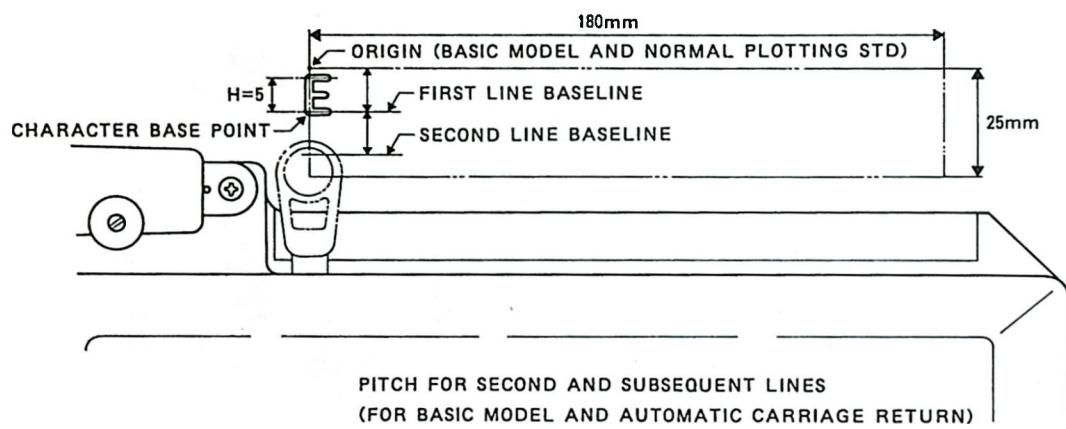
Character height (mm)	Number of lines of characters	Number of lines of tolerances	Number of characters storable in memory
1	16	16	150
2	8	8	75
3	5	5	50
3.5	4	4	43
4	4	4	37
5	3	3	30
6	2	2	25
7	2	2	21
8	1	1	19
9	1	1	16
10	1	1	15
11	1	1	13
12	1	1	12
13	1	1	11
14	1	1	10
15	1	1	10

NOTE.

- (1) The number of characters is set using the upper case W., the line spacing is automatically adjusted proportionally for the basic mode. Therefore, the character width will depend upon what character is being plotted, so that more characters than listed in the table above may be plottable on a given line. This will differ depending upon the line spacing and character spacing setting value.
- (2) The memory plotting is the amount of plotting possible in the plotting range 25 x 180mm (180mm x direction).
- (3) When performing memory plotting, a capacity of 4000 characters at up to 100 addresses may be stored. Care is required, however, as spaces and carriage returns are also included as single character.
- (4) When performing memory plotting, there is no particular limit to the capacity of a single memory location, although exceeding 4000 characters will cause subsequent address to be invalid. The number of characters plottable on a single line will be limited by the character or symbol size, so that when many characters are plotted, it is necessary to confirm beforehand the position at which a new line should be started.

1-9. Setting of Plotting Conditions

1-9-1. Plotting Area



As shown above, the plotting area extends on the horizontal scale from the 0 mark to the 180mm mark at the right and the vertical direction of the pen a point approximately 35mm from the scale edge and the plotting area extends to 25mm.

1-9-2. Plotting Preparation

Set the power switch to ON referring to the section on the main unit, the LCD will indicate "SCRIBER 202". This display indicates that plotting is ready.

When preparation for plotting is made, the pen tip position moves to the "Character Origin".

CHAPTER 2. FUNCTION KEY DESCRIPTIONS

2-1. Function Key

	MODE selection key	When power is switched on, 1st mode key is selected. Pressing key once again selects MODE 2. And pressing one more time selects MODE 3. Next pressing again selects MODE 1. Therefore, mode selection key has cyclic movement.
	Character height adjustment key	Sets the character size in the range from 1 to 15mm in 0.1mm step.
	Shift key	Function shift; pressing this key on the MODE 2 makes next letter shift a capital.
	Upward/downward carriage return key	Pressing this key moves the pen to the beginning of the next line.
	Equal spacing Backspace	Pressing this key causes even spacing of numerals, letters and characters. Moves the pen back by one character at a time. Returns to the start position when the characters are plotted from memory or monitor.
	Solid Line Key	First press the shift key, and keep pressing to draw solid line.
	Angle selection key	When power is switched on, 90° is selected. Pressing this key again selects 105°. And then pressing one more time selects 75°.
	Tolerance & fraction	Writes tolerance & fractions.
	Insert key	Inserts a space into the character string on LCD.
	Subscription & superscription	Writes subscripts and superscripts.
	Delete	Deletes a character from the LCD.
	Monitor key	Displays characters on the LCD before they are plotted, so they can be edited.
	Memory	Enters or recalls characters in memory. Memory contents may also be edited.

	Tab setting key	(Shift) Sets up to ten tabulations on TAB units of the character height.
	Tab Space key	Advances to the next tab position.
	Editing cursor	Moves the cursor left or right to edit characters on the LCD.
	Clear key	Clears all input from the upper line of the LCD, when this key is pressed.
	Stop key	Stops plotting and returns pen to origin.
	Y-Mirror	(Shift) Selects the reverse character plotting.
	Space key	Inserts a space equal to one character height.
	Half speed	Selects the low speed, effective especially for film plotting.
	Enter key	End of memory input, or end of figure plotting conditions or monitor input and start of plotting.

2-2. Mode Key and Character Key Descriptions

MODE	character key	plotting result																					
MODE 1	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>-A</td><td>x B</td><td>ø C</td></tr> <tr><td>:</td><td>,</td><td>.. /</td></tr> <tr><td>æ Ä</td><td>æ Å</td><td>æ Ñ</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	-A	x B	ø C	:	,	.. /	æ Ä	æ Å	æ Ñ	1	2	3	Upper case A B C Symbols , . / European accent Ä Å Ñ Numerals 1 2 3									
-A	x B	ø C																					
:	,	.. /																					
æ Ä	æ Å	æ Ñ																					
1	2	3																					
MODE 2	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>-A</td><td>x B</td><td>ø C</td></tr> <tr><td>:</td><td>,</td><td>.. /</td></tr> <tr><td>æ Ä</td><td>æ Å</td><td>æ Ñ</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	-A	x B	ø C	:	,	.. /	æ Ä	æ Å	æ Ñ	1	2	3	Lower case a b c Symbols , . / European accent ä å ñ Numerals 1 2 3									
-A	x B	ø C																					
:	,	.. /																					
æ Ä	æ Å	æ Ñ																					
1	2	3																					
		<small>*Upper case: MODE 1 enable for 1 character only after shift is pressed.</small>																					
MODE 3	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>ø Q</td><td>ø W</td><td>ø E</td></tr> <tr><td>-A</td><td>-S</td><td></td></tr> <tr><td>ø O</td><td>ø F</td><td>ø G</td></tr> <tr><td>æ Z</td><td>ø X</td><td>ø C</td></tr> <tr><td>æ Ä</td><td>æ Å</td><td>æ Ñ</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>ø L</td><td>ø +</td><td></td></tr> </table>	ø Q	ø W	ø E	-A	-S		ø O	ø F	ø G	æ Z	ø X	ø C	æ Ä	æ Å	æ Ñ	1	2	3	ø L	ø +		Symbols & ? ◀ ▶ () {} Greek letters α β θ Scandinavian letters Å æ œ Numerals 1 2 3 Enclosed circle lettering.  
ø Q	ø W	ø E																					
-A	-S																						
ø O	ø F	ø G																					
æ Z	ø X	ø C																					
æ Ä	æ Å	æ Ñ																					
1	2	3																					
ø L	ø +																						

2-3. Alarm Beeper and Error Display

If the setting conditions (character height, pen position) exceed the plotting area, a beeper will activate and "OUT OF AREA" will appear on the LCD, indicating that the plotting area has been exceeded.

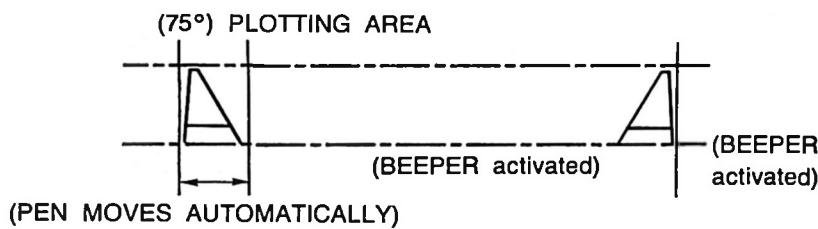
The beeper will also activate if an improper key sequence is used, at which point "KEY IN ERROR" will appear on the LCD indicating an input error.

2-4. Changing the Character Height

Setting	Key operation	Upper Display Lower
Set height to 5mm		<p>H=5_</p> <p>M1 H3.5 A90****</p> <p>Pen moves to starting point with character height 5mm.</p>
Set height to 9.5mm		<p>Pen moves to starting point with character height of 9.5mm</p> <p>H=9.5</p> <p>M1 H5.0 A90****</p>
Change 8.6mm to 8.4mm (change only last digit)		<p>Pen moves to starting point with character height of 8.4mm.</p> <p>H=8.6_</p> <p>M1 H5.0 A90****</p> <p>H=8.4_</p> <p>M1 H5.0 A90****</p>

2-5. Changing the Character Inclination (Default 90°)

- The inclination of characters can be selected at 90°, 105°, 75°.
- The pen automatically moves to the right if the character at far left end (starting point) exceeds the plotting area when the angle in the 105° is set. If the character at far right end exceeds the plotting area when the angle in the 75° is set, a beeper will activate as a warning.

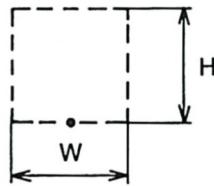


Setting	Key operation	Upper Display	Lower
Plot 123 with an inclination of 75°	 	(Press) 105° is selected. (Press again) 75° is selected. 123	M1 H3.5 A105**** M1 H3.5 A75**** M1 H3.5 A75****
Plot 123 with an inclination of 105°	 	(Press) 90° is selected again. (Press again) 105° is selected.	M1 H3.5 A90**** M1 H3.5 A105**** 123 M1 H3.5 A105

2-6. Equal Interval Spacing

- This function enables plotting alphabet, numerals and symbols in a grid pattern of equal spacings, e.g., in columns.
- The character origin (i.e., pen stopping position in equal space plotting) is at the center of the bottom of the characters.

3 1 1 2 8
A E I N 3 5



H = Character height
W = 1H

The mark • indicates the character origin for equally spaced characters.

Setting	Key operation	Display	Upper Lower
Equal Interval Plotting 1 1 . 2		M1 H35 A90*** 11.2 M1 H3.5 A90*** 	

2-7. General Plotting Method (direct plotting)

2-7-1. Capital Letters

Plotting Example	Key operation	Upper Display Lower
ABCD	[-A] [x B] [x C] [x D] (Initial condition M1)	ABCD_ M1 H3.5 A90****
MODÈLE	[x M] [O] [x D] [x E] [x È] [x L] [x E]	MODE LE_ M1 H3.5 A90****
GRØN	[x G] [x R] [MODE] [MODE] [x È] [MODE] [x N]	GRØN_ M1 H3.5 A90****

2-7-2. Small Letters

Plotting Example	Key operation	Upper Display Lower
abcd	[MODE] [-A] [x B] [x C] [x D]	abcd_ M2 H3.5 A90****
français	[MODE] [x F] [x R] [-A] [x N] [x C] [x È] [-A] [x I] [x S]	franc,ais_ M2 H3.5 A90****
grün	[MODE] [x G] [x R] [x U] [x Ä] [x N]	grün_ M2 H3.5 A90****

2-7-3. Numerals (Usable in 1st, 2nd and 3rd modes)

Plotting Example	Key operation	Upper Display Lower
01234	[0] [1] [2] [3] [4]	01234_ M1 H3.5 A90****

2-7-4. Symbols

Plotting Example	Key operation	Upper Display	Lower
() { } []	MODE MODE 1 D 1 F 1 G 1 H 1 J 1 K	() { } []	M3 H3.5 A90****
& ? %	MODE MODE 4 Q 7 W 5 R	& ? %	M3 H3.5 A90****

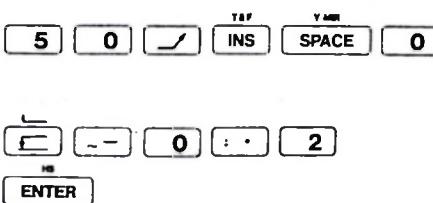
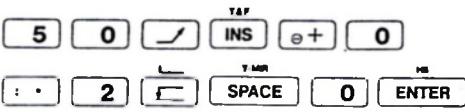
2-7-5. Subscripts and Superscripts

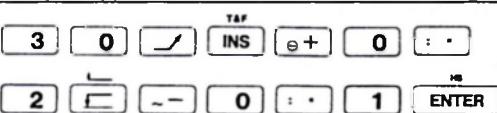
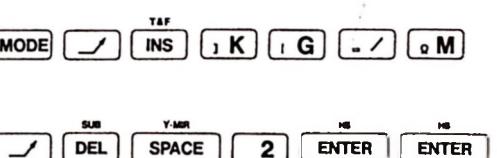
- Return plotting is only possible when using monitor or memory plotting.
- In direct plotting, pressing the **ENTER** key initiates plotting of subscripts and superscripts, and then automatically cancels their functions.

Plotting Example	Key operation	Upper Display	Lower
A ₂	- A ENTER	A ₂	M1 H3.5 A90****
m ³	MODE 0 M ENTER	m ³	M2 H3.5 A90****

2-7-6. Tolerances and Fractions

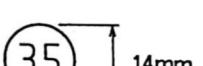
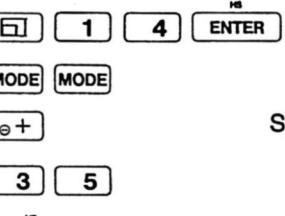
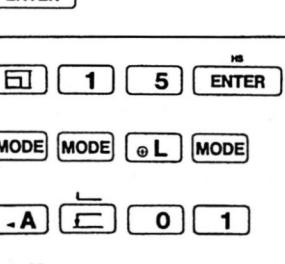
- Return plotting should be performed by using monitor or memory plotting.
- When performing direct plotting, the tolerance and fraction plotting functions are started using the **ENTER** key and simultaneously cancelled.
- When plotting tolerances and fractions, there is a limitation to the plottable character height.

Plotting Example	Key operation	Upper Display Lower
$50_{-0.2}^0$	 <p>Enter a space key to align digits if a plus or minus sign is not to be added before a tolerance.</p> <p>2nd part of 1st input is the top of the tolerance.</p>	$50_{-0.2}^0$ $50_{-0.2}^0$ F -0.2 M1 M3.5 A90**** $50_{-0.2}^0$ $50_{-0.2}^0$ F -0.2 M1 M3.5 A90
$50_{-0}^{+0.2}$		$50_{-0}^{+0.2}$ $50_{-0}^{+0.2}$ F -0.2 M1 M3.5 A90

Plotting Example	Key operation	Upper Display Lower
$30_{-0.1}^{+0.2}$		$30_{-0.1}^{+0.2}$ $30_{-0.1}^{+0.2}$ F -0.1 M1 M3.5 A90**** $20_{+0.01}^{+0.05}$ $20_{+0.01}^{+0.05}$ F +0.01 M1 M3.5 A90**** $50_{-0.3}^{+0.3}$ $50_{-0.3}^{+0.3}$ F +0.3 M1 M3.5 A90**** $50_{-28.89}^{10.01}$ $50_{-28.89}^{10.01}$ F 28.89 M1 M3.5 A90**** H_2O H_2O F 20 M1 M3.5 A90**** $1/5$ $1/5$ F 1/5 M1 M3.5 A90**** kg/m^2 kg/m^2 F kg/m ² M2 M3.5 A90**** X_2/Y_2 X_2/Y_2 F X ² /Y ² M1 M3.5 A90****
	 <p>1st enter cancels exponent.</p> <p>2nd enter cancels fraction.</p>	kg/m^2 kg/m^2 F kg/m ² M2 M3.5 A90**** X_2/Y_2 X_2/Y_2 F X ² /Y ² M1 M3.5 A90****

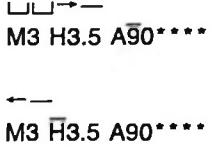
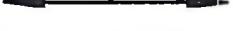
2-7-7. Plotting Enclosures

- The height of the enclosing square or rectangle is specified (diameter for a circle).
- The aspect ratio (height: horizontal) of the rectangle is 1:2.
- The character height will change automatically, depending upon the number of characters to be plotted within the enclosure. However, plotting will not be possible for a character height of 1mm or less (the beeper will activate and plotting will not be made). In such cases, reduce the number of characters or increase the height (or diameter) of the enclosure.
- In direct plotting, return plotting is not possible. Return plotting should be performed by using monitor or memory plotting.
- When performing direct plotting, the enclosure plotting function is started using the **ENTER** key and simultaneously cancelled.

Plot 35 in circle of diameter 14mm 		Specify type and height of enclosure. Specify plotted characters (align). Start plotting.	enclose \bigcirc M3 H14 A90 enclose \bigcirc 35 M3 H14 A90 ****
Plot A/01 in 2-level circle of diameter 15mm 			enclose 2 \bigcirc M3 H15 A90 enclose 2OA-F01 M1 H15 A90 ****

2-7-8. Plotting Arrows

- When the arrow (right or left) key is pressed, a beeper will activate if the plotting area has been exceeded. If this occurs, use the space key or backspace key to correct the pen position to within the available plotting area.

Plotting Example	Key Operation	Upper Display Lower
Plot arrows	 MODE MODE SPACE SPACE - S MODE MODE - A	
Plot arrows connected by solid line	 MODE MODE - A   - S	

2-8. Monitor Plotting and Editing

- The monitor mode is used when checking the characters to be plotted on the LCD before plotting. When doing this, the method of editing the display contents (i.e., performing insertion, deletion and corrections) is the same as for memory plotting.
- After verifying the display contents, to plot the display contents press the  key.
- Even after plotting has been completed, the display contents are held and, in the same manner as for memory plotting, overlaid (return) plotting is possible. (Max. 16 times)
- If actual plotting is not required, press the   key and the display will be erased.
- Up to 200 characters may be monitored.

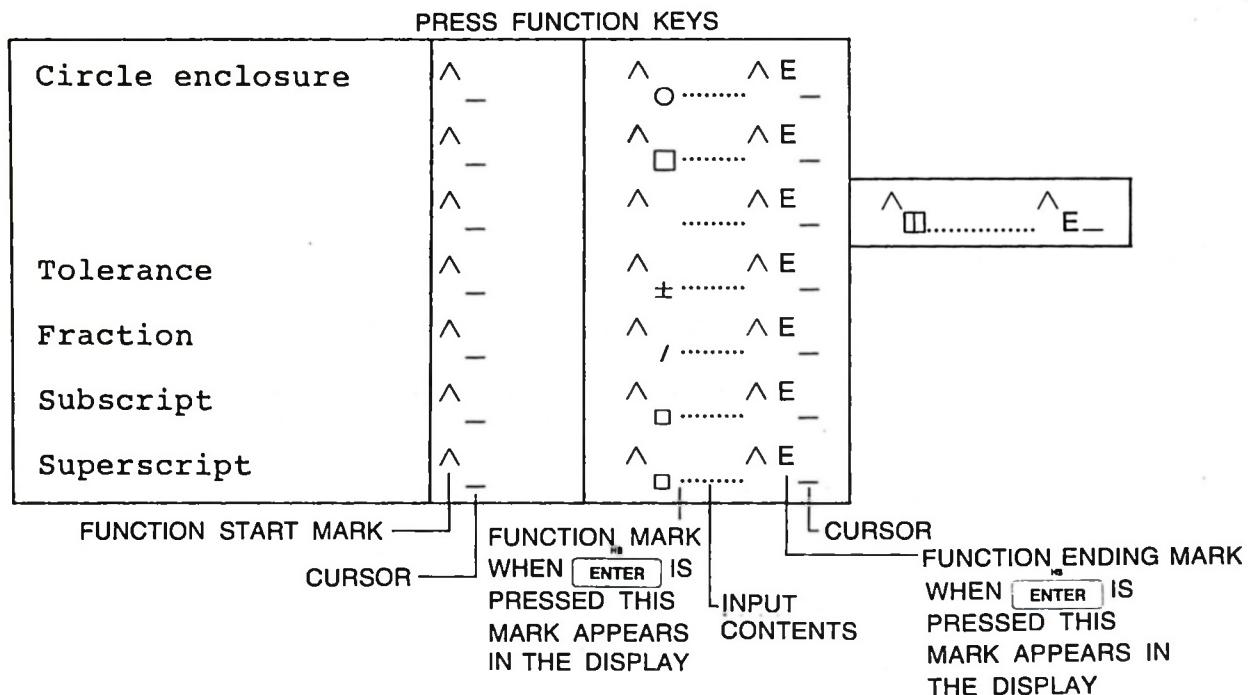
<p>Change data contents from MUTHO to MUTOH (partial change)</p>	<p>MON M-MR M U T O H</p> <p>TAB TAB Move cursor to beneath H.</p> <p>ENTER When a correction is completed, plotting begins.</p>	<p>MUTHO_ M1 H3.5 A90 MON*</p> <p>MUTHO M1 H35 A90 MON*</p> <p>MUTOH M1 H3.5 A90 MON*</p>
<p>Add data contents of MUTOH with SCRIBER</p>	<p>TAB S TAB S x 4 times Move cursor to beneath H</p> <p>ENTER when data is completed, plotting begins</p>	<p>MUTOH M1 H3.5 A90 MON*</p> <p>MUTOH M1 H3.5 A90 MON*</p> <p>MUTOH M1 H3.5 A90 MON*</p>
<p>MUTOH SCRIBER</p>	<p>ENTER when data is completed, plotting begins</p>	<p>MUTOH M1 H3.5 A90 MON*</p> <p>MUTOH SCRIBER M1 H3.5 A90 MON*</p>
<p>Change monitor contents from MUTOH SCRIBER to SCRIBER ET202</p>	<p>STOP The pen moves origin</p> <p>DEL x 6 times Delete MUTOH and spaces</p> <p>TAB S x 7 times Move the cursor input position next to R</p> <p>ENTER Insert SPACE next to R</p> <p>ENTER</p>	<p>MUTOH SCRIBER M H3.5 A90 MON*</p> <p>SCRIBER M1 H3.5 A90 MON*</p>
<p>Make an overlaid plot of the same contents (return plotting)</p>	<p>ENTER</p>	<p>ET202 M1 H3.5 A90 MON*</p>

Delete full contents in a LCD	 	M1 H3.5 A90 MON
Cancel monitor plotting	 	M1 H3.5 A90

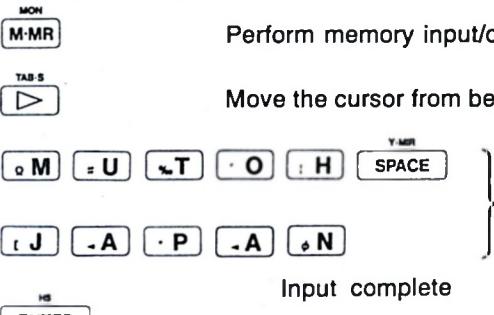
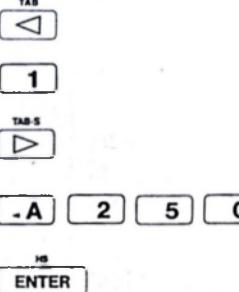
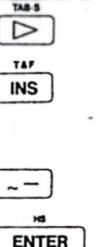
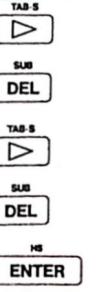
2-9. Memory Plotting and Editing

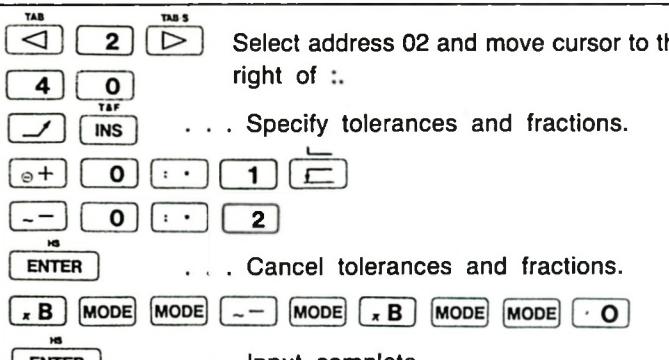
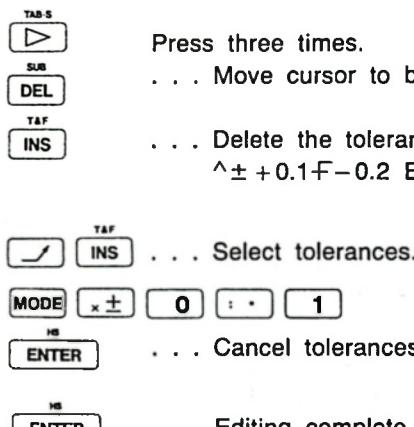
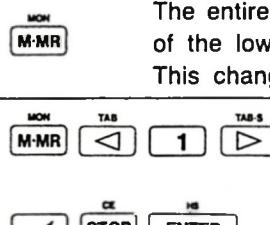
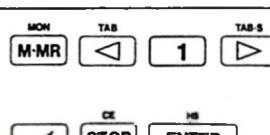
- Memory addresses in the range 00 through 99 (100 addresses) may be used.
- The capacity per address is 1800 characters limited. Therefore, when storing long phrases and strings of symbols in memory, even if the TOTAL capacity is 4000 characters, maximum capacity per address is not always 1800 characters. (For example, if each address is used to store 50 characters, only addresses 00 through 79 will be usable. Similarly, with 100 characters at each address, only addresses 00 through 39 will be usable.)
- The memory address display appears at the upper left of the liquid crystal display. When the  key is pressed, "00:" appears.
- When a desired address with a long sentence stored in memory is recalled, up to 13 characters starting at the beginning of the contents are displayed. The 14th character and beyond may be scrolled to 1 character at a time. (For continuous scrolling, press the key continuously.)
- Editing operations such as insertion, deletion and correction take effect after the  key is pressed. And then press  again start to plot.
- The number of characters plottable per line and the number of lines will depend upon the setting of the character height. Refer to the table on character height and number of lines and characters in section 0.0 for details.
- Memory and Monitor Plotting Display
The displayed indicators for enclosures (circles, 2-level circles), tolerances, fractions, subscripts and superscripts are as follows.

Memory & monitor plotting display



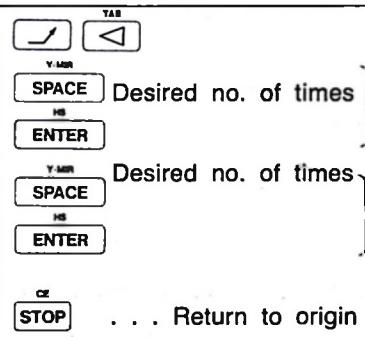
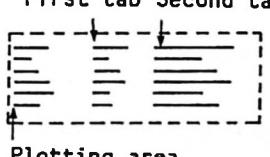
- Insertions, deletions and corrections are made in the range ^.....^E.
 1. Correction of the ... part before the function completed, (E for **ENTER** key) mark is made by entering exactly the same number of characters as were deleted using the delete key.
 2. For the ... part after the function end mark appears (when the Enter key is pressed):
 - (a) For monitor plotting, press **STOP** key and **ENTER** once again.
 - (b) For memory plotting, move the cursor to the function start mark **E** and delete using the **DEL** key. To change contents, press the **INS** key or perform new input.
- A memory address listing is provided at the end of this document as for convenient recording of memory contents.

Plotting Example	Key operation	Upper Display Lower
Make the new input MUTOH JAPAN	 <p>Perform memory input/output Move the cursor from beneath the : to the right. Input contents Input complete</p>	4000 FREE AD000 00: M1 H3.5 A90 MEM* 00:_ M1 H3.5 A90 MEM* 00:MUTOH_ M1 H3.5 A90 MEM* 00:MUTOH JAPAN. M1 H3.5 A90 MEM* 00:MUTOH JAPAN. M1 H3.5 A90 MEM*
Plot from the current pen stopped position		00:MUTOH JAPAN
Plot from the plotting area origin position		00:MUTOH JAPAN
Plot after a carriage return		00:MUTOH JAPAN
Overlay plot the same contents (return plotting)		Pen returns to M and performs return plotting 00:MUTOH JAPAN
Change from address 00 to 01	 <p>... Moves cursor to beneath 1. ... Selects address 01. ... Moves cursor from beneath : to the right.</p>	00:MUTOH ET1000 M1 H3.5 A90 MEM* 01: M1 H3.5 A90 MEM* 01:_ M1 H3.5 A90 MEM* 01:A250 M1 H3.5 A90 MEM* 01:A250 M1 H3.5 A90 MEM*
Input A250		Input complete
Change memory contents from A250 to A-250	 <p>Press twice ... cursor moves to beneath 2. ... Opens an inserted space at the cursor position. Inserts a - ... Editing complete</p>	01:A250 M1 H3.5 A90 MEM* 01:A_250 M1 H3.5 A90 MEM* 01:A-250 M1 H3.5 A90 MEM* 01:A-250 M1 H3.5 A90 MEM*
Change memory contents from A-250 to A-5	 <p>Press 3 times ... cursor moves to beneath 2. ... Character at the cursor is deleted. ... Move the cursor to beneath 0. ... Delete the character at the cursor. ... Editing complete.</p>	01:A-250 M1 H3.5 A90 MEM* 01:A-50 M1 H3.5 A90 MEM* 01:A-50 M1 H3.5 A90 MEM* 01:A-5 M1 H3.5 A90 MEM* 01:A-5 M1 H3.5 A90 MEM*

Plotting Example	Key operation	Upper Display Lower
Input $40^{+0.1}_{-0.2} B \sim B'$ (Address 02)	 Select address 02 and move cursor to the right of :. . . . Specify tolerances and fractions. . . . Cancel tolerances and fractions. . . . Input complete	02:_ M1 H3.5 A90 MEM* 02:40_ 02:40^__ 02:40^+ 0.1F_ 02:40^+ 0.1F- 0.2_ 02:40^ ± + 0.1F- 0.2^E_ 02:40^ ± + 0.1F- 0.2^EB- B_ 02:40^ ± + 0.1F- 0.2^EB- B' M3 H3.5 A90 MEM*
Change memory contents from $40^{+0.1}_{-0.2} B \sim B'$ to $40 \pm 0.1 B \sim B'$	 Press three times. . . . Move cursor to below the ^ Delete the tolerance up to ^ ± + 0.1F- 0.2 E. . . . Select tolerances. . . . Cancel tolerances . . . Editing complete	02:40^ ± + 0.1 - 0.2^EB- B' 02:40_B- B0 02:40_B ~ B' 02:40^ ~ B' 02:40^ ± 0.1 02:40^ ± 0.1 EB B'_ 02:40^ ± ± 0.1^EB- B' M1 H3.5 A90 MEM*
	When correcting memory contents concerned with enclosures, (circles, squares, rectangles) tolerances, fractions, subscripts and superscripts, always delete the contents before reentering (inserting).	
Cancel the memory function	 The entire upper part of the display and MEM of the lower parts are blanked. This changes to ***.	M1 H3.5 A90 ***
Delete memory contents (for any given address)	 This is the example of recalling address 01. Contents of address 01 are cleared.	01:A-5 01: M1 H3.5 A90 MEM*

2-10. Tab Setting

- The setting position is made in units of a space in effect for the currently set character height.
- Ten locations may be set.
- The tab space causes spaces to the next set tab to be left blank whenever the  key is pressed.
- In case of using with (□□□) Equal interval functions, the LCD indicate ■. Be sure, set first Equal Interval function and then set Tab function. If the both functions need to be cancelled, first cancel the Tab function and then, Equal Interval function.
- Tabulation pattern cannot be stored in the memory.

Plotting Example	Key operation	Upper Display	Lower
Set two tabs at desired locations (character height = space width)	 <p>Desired no. of times } Desired no. of times } 1st tab setting } 2nd tab setting } . . . Return to origin</p>  <p>First tab Second tab Plotting area</p>	M1 H3.5 A90 ***...T M1 H3.5 A90 *** ...T	
Tab space	 <p>. . . Leave blank spaces up to the next set tab. A beeper will sound if there is no next set tab.</p>		
Cancel tab setting		M1 H3.5 A90***...**	

2-11. Upward Carriage Return

In the initial (setting) pen moves from top position to bottom position.

Plotting Example	Key operation	Upper Display	Lower
Upward return setting			

2-12. Reversed Plotting

- The plotting direction change command can be given as S=Standard, Y=Y M (where M indicates mirror image reversal).
- If overlaid plotting is required, use the monitor plotting mode.
- Since reversed plotting may not be stored in memory, the characters to be plotted should be stored in memory first in the standard mode (S=STD), then recalled and then direction changed.

Plotting Example	Key operation	Upper Display Lower
ABC	  . . . Specify reversed Move to the Origin  	M1 Y H3.5 A90*** ABC M1 Y H3.5 A90****
Cancel Y=M1R setting	 	M1 H3.5 A90****

2-13. Half-Speed Plotting

- When plotting a line between any two given points and when it is desired to make dense plotting lines on film or similar materials, half-speed plotting may be performed to improve the quality of plotting.
- Setting and cancelling the half-speed function are performed in a similar manner and the function is appearing in the LCD lower line.

Plotting Example	Key operation	Upper Display Lower
Half-speed setting and cancelling	 	m1 H3.5 A90*

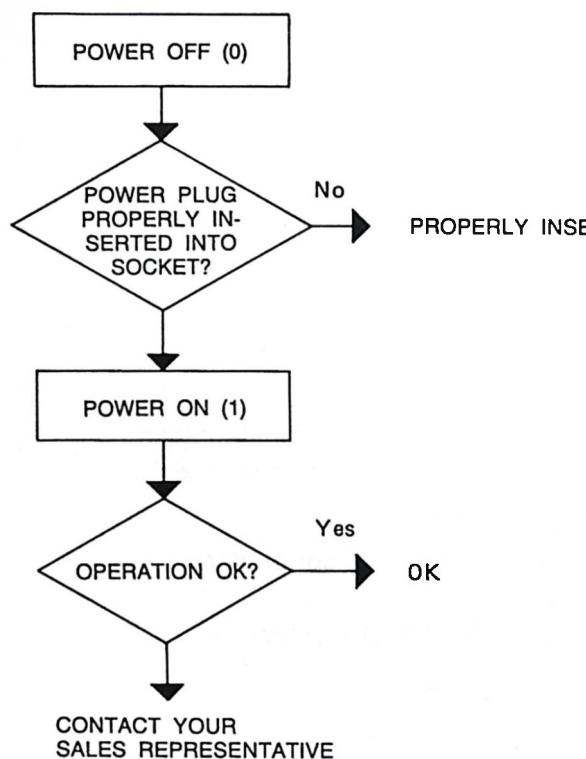
CHAPTER 3. SPECIFICATIONS

Items	Specifications
Plotting area	180 × 25mm
Plotting tools	Technical drawing pen
Resolution	0.025mm
Initial letter height	3.5mm
Character & symbol height	1 ~ 15mm
Character inclination angle	75, 90, 105 (3 steps)
Plotting speed	Max. 20mm/sec (2 steps)
Character spacing	Automatic proportional, conforming to ISO standards. Equal spacing (digits aligned)
Line spacing	Automatic proportional conforming to ISO standards
Memory	00 ~ 99 characters = 4000 characters (Limitation of capacity at one address 1800 characters)
Display	Liquid crystal with cursor and scroll function: 16ch × 2 lines = 32 characters
Keyboard	Flat-panel switches
Plotting type	Alphanumeric characters, upper case, lower case, numerals conforming to ISO
Operation unit dimensions	310 × 114 × 44mm
Operation unit weight	1.0kg
Adaptor dimension	57 × 78 × 42mm
Adaptor weight	0.45kg
Voltage	220V ± 15%
Power consumption	23W
Operating temperature	5 ~ 40°C
Storage temperature	-5°C ~ 60°C

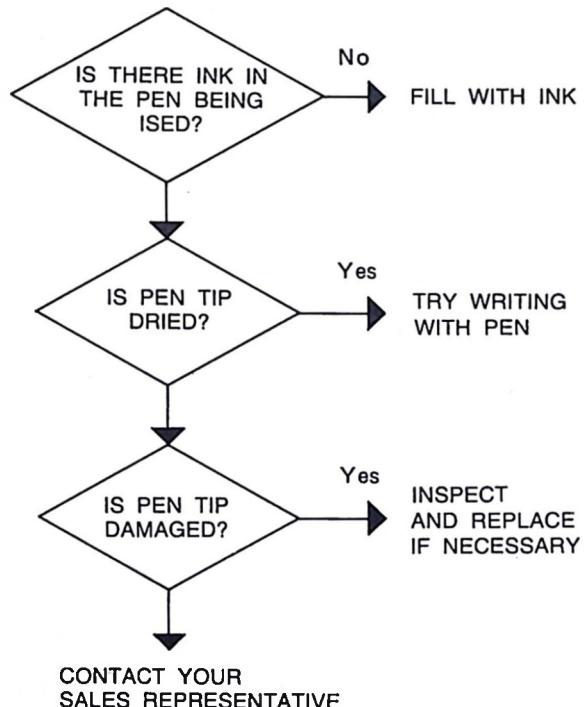
CHECKS TO BE PERFORMED WHEN YOU SUSPECT A FAILURE

Apparent improper operation of the ET202 is often suspected to be a failure. To verify this, perform the checks described as belows.

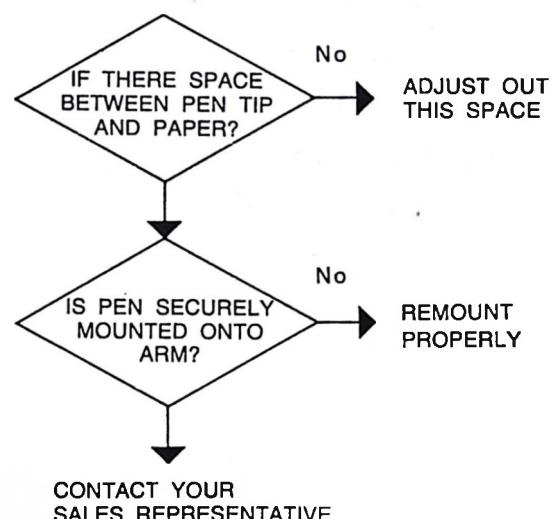
No Operation At All



Operation Possible No Plotting is Performed

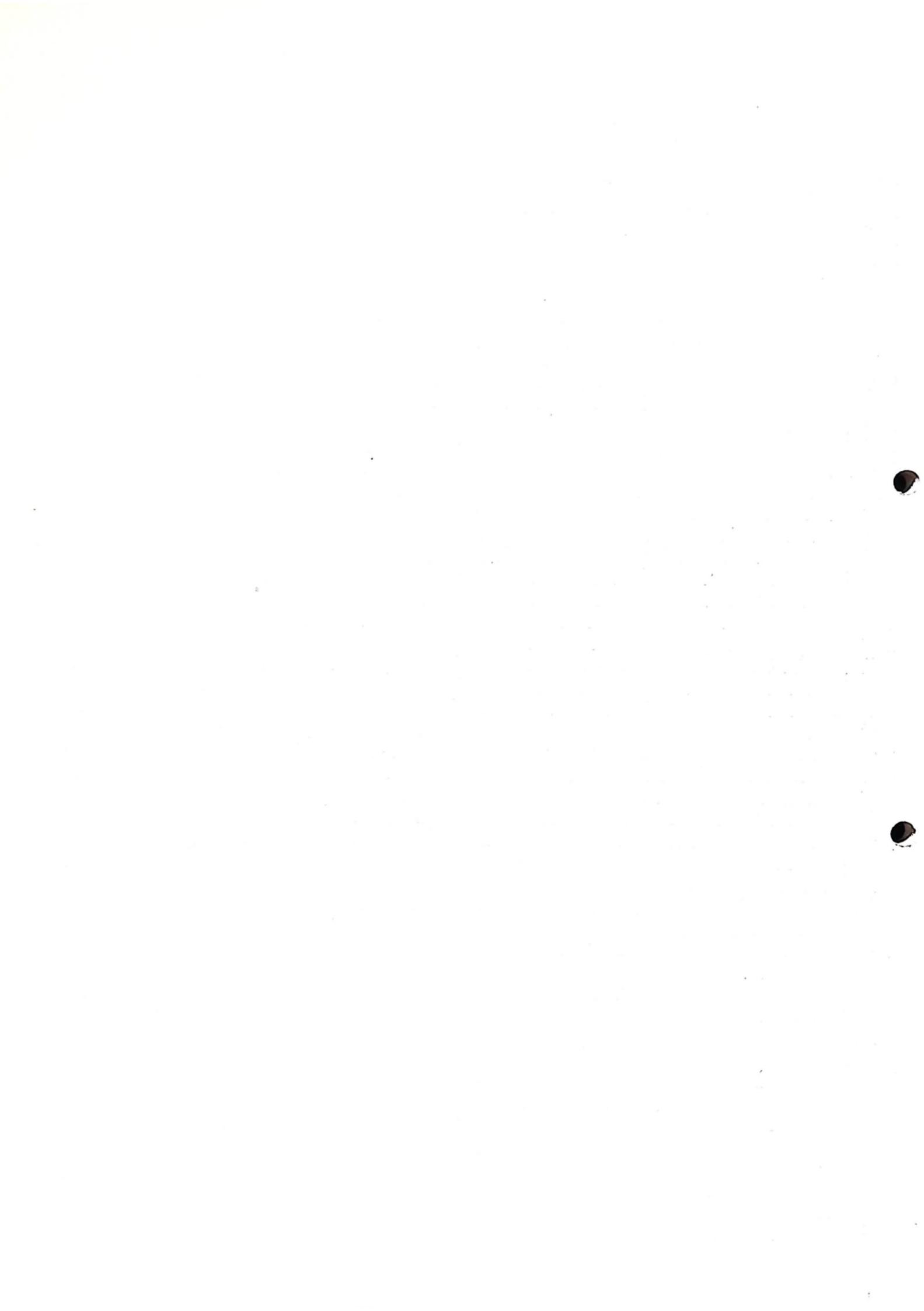


Poor Plotting Quality or No Plotting Possible



Name :
Date :

Adr.	Contents	Adr.	Contents
00		50	
01		51	
02		52	
03		53	
04		54	
05		55	
06		56	
07		57	
08		58	
09		59	
10		60	
11		61	
12		62	
13		63	
14		64	
15		65	
16		66	
17		67	
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39		89	
40		90	
41		91	
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43		93	
44		94	
45		95	
46		96	
47		97	
48		98	
49		99	



Drafting Machines and Graphic Systems



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